# NiTek Duo Dive Computer

## User Guide

Dive Rite

**Date of purchase:** _____

**www.diverite.com**

| | |
|---|---|
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## Chapter 1

# Introduction

### Summary

This chapter provides an overview of the NiTek Duo, lists the NiTek Duo's features and functions, and covers warning information that should be read before using your NiTek Duo.

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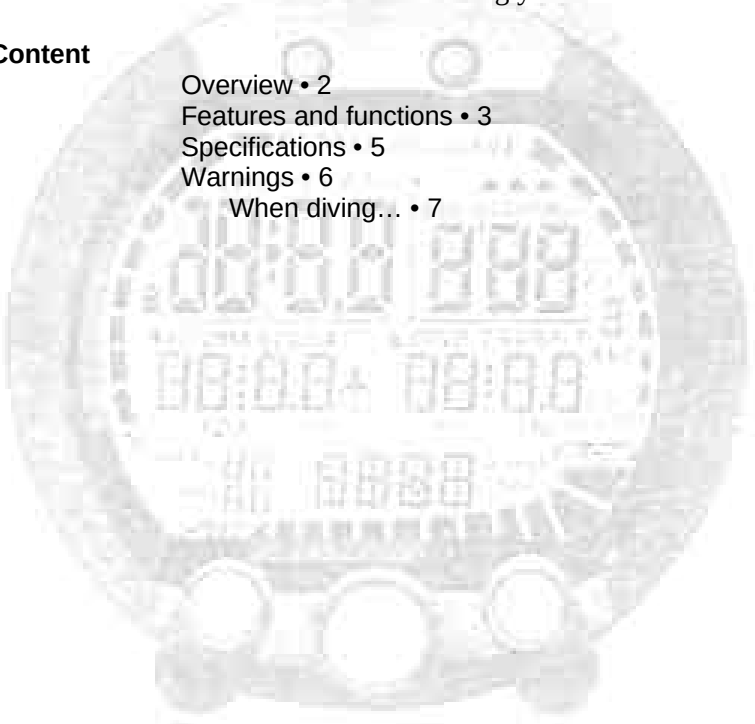

## Overview

Congratulations on your purchase of the NiTek Duo dive computer. The NiTek Duo is a sophisticated and comprehensive dive computer that was designed to offer you the latest in dive computer technology, safety, and reliability.

The NiTek Duo dive computer is a multifunctional computer for recreational diving, providing information on depth, dive times, no-decompression and decompression times, and nitrogen and O2 absorption and elimination during all dive phases, including ascent, surface interval times, and subsequent dives.

This information is displayed on an easy-to-read display, providing simple and direct communication between the diver and the computer. With an easy-to-read display, the diver has no problem following and reading the displayed information.

The NiTek Duo comes standard with a number of modes, including a time mode, dive set mode, dive plan mode, log mode, profile mode, PC transfer mode, and dive mode.

**Note:** It is extremely important that you carefully read and understand this manual. Make sure you fully understand how the NiTek Duo operates before diving with it.

This manual has been divided into three chapters:

- **Introduction:** Covers the features and functions, specifications, and warnings for the NiTek Duo
- **Using the NiTek Duo:** Covers the operation of each mode for the NiTek Duo
- **Care and maintenance:** Covers how to properly care for and maintain the NiTek Duo and change the battery

## Features and functions

The NiTek Duo incorporates a number of important modes and features:

- The NiTek Duo turns on automatically upon descent
- On the surface, the NiTek Duo constantly displays a minimum of date and time
- The NiTek Duo uses easily accessible and highly reliable push buttons instead of exposed electrical contacts
- The NiTek Duo can be programmed to monitor exposure to two different gas mixtures during a dive. Mix1 is programmable for mixtures ranging from air (EAN21) to EAN50. Mix2 is programmable for mixtures ranging from air (EAN21) to EAN99. Underwater, NiTek Duo users can switch between mixes at the push of a button.
- The NiTek Duo is capable of functioning up to a depth of 328 feet (100 meters) when in dive computer mode and 656 feet (200 meters) when in gauge mode
- The NiTek Duo automatically adjusts for altitudes up to 19,685 feet (6,000 meters)
- The NiTek Duo displays a variety of data underwater including: date, time of day, current and maximum depths, no-decompression dive time elapsed and remaining, and water temperature
- The NiTek Duo displays data specifically related to the use of Enriched Air Nitrox (EANx) including: fraction of oxygen (FO2) setting, partial pressure of oxygen (PO2), and an oxygen limit index (OLI) representing the cumulative effect of a diver's exposure to elevated PO2s (the theoretical "CNS clock") as a bar graph
- Through a combination of audible and visible alarms, the NiTek Duo helps to alert the diver to a number of possibly hazardous situations including: violation of ascent rate, no-decompression state, and whether mandatory decompression stops are necessary or if the diver has ascended above a mandatory stop ceiling. Nitrox specific warnings occur when the diver approaches or exceeds a limiting PO2 of 1.4

atmospheres for mix1 and 1.6 atmospheres for mix2, and when cumulative exposure to elevated PO2s exceeds recommended limits.

- The NiTek Duo can calculate decompression stop requirements for stops as deep as 90 feet (27 meters)
- The NiTek Duo can be programmed to display data in Imperial or metric units
- Dive depth can be displayed in fresh or salt water equivalents
- Special mode indicators make it easy to determine what display mode or screen you are in at any time
- The NiTek Duo has a back light to illuminate the screen, which can be turned on with the touch of a button
- The NiTek Duo's memory capability enables it to hold and display log data on up to 30 hours of dive time or 60 dives
- Detailed dive-profile information can be stored for each dive through user-programmable sample intervals of 15 or 30 seconds (longer intervals allow data for a greater number of dives)
- Dive data can be uploaded and stored in a dive log format on a desktop or laptop computer using the NiTekLogic™ software and optional PC interface

## Specifications

Algorithm: Buhlmann ZH-L16

Sample tissues: 9

Tissue half-lives: from 5 to 640 minutes

Size and weight
- Diameter: 2.5 in (62 mm)
- Height: 1.0 in (25 mm)
- Weight: 4 ounces (115 g)

Display face
- Backlight illumination
- Low battery indicator
- Three user buttons
- Water immersion switch

Depth sensor
- Sea water calibration (fresh water depths are about 3% lower)
- Measuring range: 0 to 328 feet (0 to 100 m) measured every second (Gauge mode 656 feet (200 m)
- Accuracy: +/- 3% + 2 feet (0.5 m)
- Surface interval time: from 0 to 48 hrs
- Diving time: from 0 to 599 minutes
- Ascent rate warning: 26 to 52 feet per minute (8 to 18 m)

Thermometer
- Measuring range: 23 °F to 104 °F (-5 to 40 °C)
- Accuracy: +/- 4 °F (2 °C)
- Measurement interval: Every minute

Clock
- Accuracy: +/- 30 sec on average per month
- 24-hour display

Altitude
- Altitude function monitoring: from 0 to 19,685 feet (6,000 m) measured every 10 minutes
- Accuracy: +/- 800 feet (250 meters)

Battery
- Li/MnO2 CR 2032 3V button battery
- Average battery life: About 3 years (50 dives/year)
- Replacement: User replaceable or return to manufacturer

Breathing gas
- Mixes: 2 gas settings
- O2 setting range: Mix1 21 to 50 percent, Mix2 21 to 99 percent
- O2 setting: 1% increments

Dive log
- Dive logging: Maximum of 60 dives
- Profile logging: Maximum of 30 hours
- Profile sampling rates: 15 or 30 seconds

## Warnings

This information has been developed for your safety. Please read and understand this manual completely before using your NiTek Duo dive computer.

Important safety information:

- Before using your NiTek Duo, it is extremely important that you read the following points—as well as similar warning and caution notices that appear throughout this manual. Failure to do so could result in damage to or loss of equipment, serious personal injury, or death.
- The NiTek Duo is designed for use by certified divers who have maintained a sufficient level of knowledge and skill proficiency through a combination of formal training, ongoing study, and experience. It is not intended for use by persons who lack these qualifications and thus, may not be able to identify, assess, and manage the risks scuba diving entails. Use of the NiTek Duo in conjunction with Enriched Air Nitrox (EANx) requires that divers be trained and certified for Nitrox diving.
- The NiTek Duo is not intended for use by commercial or military divers whose activities may take them beyond the commonly accepted depth limits for recreational or technical diving.
- Although the NiTek Duo is capable of calculating decompression stop requirements, users must remember that dives requiring mandatory stage decompression carry substantially greater risk than dives made well within no-decompression limits.
- The NiTek Duo is designed for use by one diver at a time. Divers should not share a single NiTek Duo—or any other dive computer—on the same dive. Additionally, no diver should lend their NiTek Duo to anyone else until it calculates that no measurable residual nitrogen remains after previous dives and no longer displays the “desaturation time” indicator while in time mode. Further, no diver should use their NiTek Duo for repetitive dives—unless that same properly functioning NiTek Duo has accompanied them on

all previous dives in the same repetitive dive series and is thus, accurately monitoring the diver's total exposure to oxygen and nitrogen.

- Neither the NiTek Duo—nor any other dive computer—physically measures the amount of nitrogen present in body tissues or the rate at which nitrogen is being absorbed or released. The NiTek Duo monitors depth and time, and uses this data to work a mathematical formula designed to emulate how individuals in good general health and whose physical characteristics do not place them among those at higher risk of decompression illness (DCI) are assumed to absorb and release nitrogen from body tissues. Thus, the NiTek Duo cannot compensate for factors such as age, obesity, dehydration, cold, or exertion, which experts believe place divers at greater risk of DCI. If these, or similar factors apply to you, use the NiTek Duo—and other dive computers or dive tables—with even greater caution.
- Little is known regarding the exact nature and causes of decompression illness (also known as decompression sickness, DCI, or DCS). Susceptibility to DCI may vary substantially from person to person and from day to day. Neither the NiTek Duo—nor any other dive table or computer—can guarantee that you will not suffer decompression illness. Even though you use these items correctly, you may still suffer DCI. Use your NiTek Duo conservatively and in conjunction with other dive planning devices, such as dive tables. Do not rely on the NiTek Duo, or any similar device, as your sole means of avoiding decompression illness.

## When diving…

- Do not "push" the no-decompression limits (NDLs). Make safety stops before ascending. If you exceed the no-decompression limits, check your breathing gas supply at all stop depths.
- The NiTek Duo does not monitor breathing gas supply. You must monitor this yourself, on every dive, using a submersible pressure gauge or equivalent device.

- Do not rely solely on this or any other dive computer. Take a back-up dive computer or dive tables (along with a separate means of monitoring depth and dive time).
- Be aware that the NiTek Duo makes assumptions regarding residual nitrogen based on altitude settings. Avoid making abrupt changes in altitude following a dive, as doing so may be very dangerous.

## Chapter 2

# Using the NiTek Duo

### Summary

This chapter provides topics about using, setting, and understanding each of the modes and options of the NiTek Duo.

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## Getting started

The NiTek Duo has many modes and screens and a number of options that can be changed depending on your dive location and profile. The following is a checklist of general things that you should pay attention to before, during, and after a dive.

### Before a dive

- Check that the proper time and date are set. If you traveled, your NiTek Duo may be set to your home time zone.
- Check that the proper mixes are set for mix1 and mix2. If you are using gauge mode, make sure it is set to “gage.”
- Make sure that you review the dive plan mode for maximum depths and times for the mixes you are using

### During a dive

- Monitor the NiTek Duo throughout your dive for depth and time
- Monitor the N2 and O2 loading bar graphs
- Pay attention to any alarms, such as an ascent rate warning
- Follow the no-decompression limits or complete the required decompression displayed and perform the necessary safety stop

### After a dive

- Monitor surface interval time if making another dive
- Follow the no-fly requirements
- Review your dive using the log mode and profile mode
- Download the dive log to your PC if you have the optional PC interface

## Accessing display modes and screens

There are some display modes that the NiTek Duo enters and/or exits automatically. For example, by taking the NiTek Duo underwater, the dive mode automatically turns on. Upon surfacing, the NiTek Duo automatically enters the time mode.

Accessing other modes or screens requires the use of the NiTek Duo's buttons.

### Button operation

The NiTek Duo has three buttons (select, mode, and set), which are used to access the different modes and screens. To use the buttons, simply press the button once or hold the button down depending on what you are trying to do. What procedure to use is clearly defined in each topic throughout the manual.

- Select button: This button is used to select the option field that you want to change
- Mode button: This button is used to select and scroll through the different modes, such as time mode
- Set button: This button is used to set an option's setting, such as setting the date

The front of the NiTek Duo, showing the three buttons that are used to access and setup the different modes and screens

## Time display mode

Time display mode is the NiTek Duo's default mode. The computer returns to this mode automatically upon surfacing from a dive and from other modes when a period of time has passed without any buttons being pressed.

In time display mode, "time" (1) is displayed at the bottom of the screen, and the date (2) and time (3) with seconds (4) are displayed. Time can also be displayed in 24-hour (military) time. The NiTek Duo may display additional information concerning exposure to nitrogen and oxygen, desaturation time, surface interval time, and altitude. These items are covered in "Surface mode" and "Altitude operation."

### Setting the time and date

Setting the time and date are done in the time set mode. You can enter or change the year, month, day, hours, minutes, and seconds in this mode.

**To set the time and date:**

1. Press Mode until "set" is displayed in the "time" position.

   The "seconds" field flashes.

2. Press Set to "00" the seconds or press Select to go to another field, such as minutes.

3. Using Select and Set, set the year, month, day, hour, minutes, seconds, and whether you want the time displayed in 24-hour format.

For example, 1:00 PM would be 13:00.

4. Press Mode.

   The computer returns to the time display mode.

## Entering time display mode from another mode

When you are using other modes, it is very easy to return to the time display mode.

**To enter time display mode from another mode:**

1. Press and hold Mode for two seconds.

—OR—

2. Press Mode until “time” is displayed.

## Activating the back light

The NiTek Duo has a back light that illuminates the screen.

**To activate the back light:**

1. Press either the Select or Set button.

   The back light illuminates for four to five seconds.

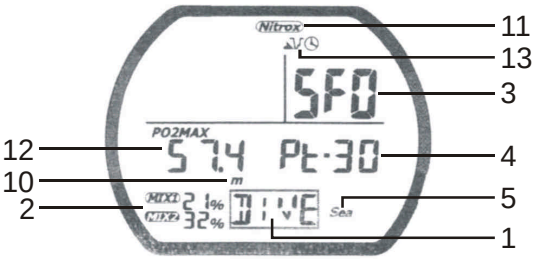
2. Press either button again to reactivate the back light.

## Dive option set and display mode

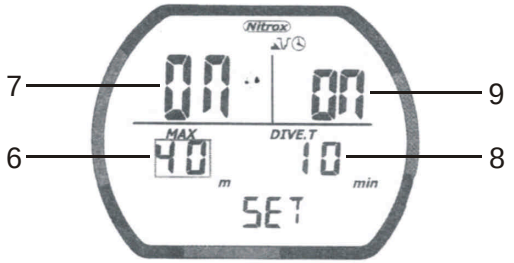
Dive option set and display mode is where all “dive” option settings are displayed and set up. There are two screens needed to view and set up all dive options.

### Using computer mode

Computer mode is when the NiTek Duo is operating in the normal computer mode. “Dive” is displayed on the screen and all computer mode functions operate normally. The NiTek Duo dive option set and display mode is used to review and change option settings that pertain to an upcoming dive. The operating depth limit when in dive operation is 328 feet (100 meters).




Dive option display and set fields for screen one




Dive option display and set fields for screen two

- (1) Dive operation
- (2) Mix1 and mix2 FO2 gas percentages
- (3) Dive safety factor

- (4) Dive profile sampling rate
- (5) Salt or fresh water use
- (6, 7) Maximum depth alarm
- (8, 9) Maximum time alarm
- (10) Metric or Imperial units of measurement

There are three “display only” option fields that change based on how the above settings are set.

- (11) Nitrox indicator: “Nitrox” is displayed if mix1 is set for a PO2 of greater than 21 percent. If mix1 is set for 21 percent (air), nothing appears. If mix1 is in “default,” the Nitrox indicator flashes. For more information on “default,” see “Understanding FO2 default.”
- (12) Maximum operating depth (MOD) for FO2 setting: This is the safe operating depth (maximum) for the selected mix. These are based on limiting PO2 factors of 1.4 or 1.6 atmospheres respectively.
- (13) Maximum depth and time alarm indicators: When you see an indicator symbol, the alarm is set to on.

  Max depth symbol:

  Max time symbol:

**To enter dive operation:**

1. Press Mode until “dive” is displayed.
2. Using the topics that follow, set up your desired dive option settings.
3. If you want to exit dive mode, press and hold Mode for 1 to 2 seconds to return to time mode.

## Setting Mix1 and Mix2 percentages

You must set the breathing mix you plan on using on your dive. Mix1 is considered the first breathing gas you plan on using during a dive, and mix2 is considered the second breathing gas you are using on a dive.

- Mix1 can be set for 21 to 50 percent oxygen
- Mix2 can be set for 21 to 99 percent oxygen

**Note:** If you only plan on using one mix on your dive, you only need to set mix1.

**To set mix1 and mix2 percentages:**

1. Press Mode until “dive” is displayed and flashing on the screen.
2. Press Select to select the mix1 field.
3. Press and release Set to increase the percentage.

   Press and hold Set to advance the percentages rapidly. The percentage will stop at 32 percent and again at 50 percent.
4. Press Select to advance to mix2.
5. If *you are* entering a percentage for mix2, press and release Set to increase the percentage. If *you are not* setting a percentage for mix2, press Select to advance to the safety factor setting.

   Press and hold Set to advance the percentages rapidly. The percentage will stop at 32 percent and again at 21 percent.
6. When finished, press Select to advance to the next option (safety factor) or to exit, press and hold Mode for 1 to 2 seconds to return to time mode.

## Setting the safety factor

The safety factor setting is used to add an additional safety margin to the no-decompression limits and decompression stop times. There are three possible settings, 0, 1, and 2. A higher setting results in shorter no-decompression limits and longer decompression stop times.

| Setting | Description |
|---|---|
| 0 | Calculations are based solely on its built-in algorithm (Buhlmann ZH-L16) |
| 1 | Calculations are based on one altitude rank higher than the dive was actually made |
| 2 | Calculations are based on two altitude ranks higher than the dive was actually made |

**To set the safety factor:**

1. Press Mode until “dive” is displayed and flashing on the screen.
2. Press Select until the safety factor field is flashing.
3. Press Set to select the desired safety factor.
4. When finished, press Select to advance to the next option (profile sampling rate) or to exit, press and hold Mode for 1 to 2 seconds to return to time mode.

## Setting the dive profile sampling rate

The NiTek Duo allows you to choose how frequently it samples and stores depth data. The data it samples and stores is used in profile mode or when the data is uploaded to a personal computer. There are two sampling rates to choose from, 15-second and 30-second.

The 15-second sampling rate enables the computer to sample and store depth data every 15 seconds during a dive. The 15-second sampling rate provides a more detailed dive profile, but because it stores more information, fewer dives can be stored.

The 30-second sampling rate enables the computer to sample and store depth data every 30 seconds during a dive. The 30-second sampling rate is the computer’s “default” setting. The 30-second rate provides a less detailed dive profile, but it is capable of storing more information for more dives.

**Note:** When the computer’s memory storage is full, it overwrites the oldest dive profile data stored with the new information.

**To set the dive profile sampling rate:**

1. Press Mode until “dive” is displayed and flashing on the screen.
2. Press Select until the sampling rate “number” is flashing.
3. Press Set to toggle between 15- and 30-seconds.
4. When finished, press Select to advance to the next option (fresh or salt water use) or to exit, press and hold Mode for 1 to 2 seconds to return to time mode.

## Setting for fresh or salt water use

The NiTek Duo is capable of operating using fresh or salt water calculations. This is based on:

- One atmosphere of saltwater is 33 feet (10 meters)
- One atmosphere of freshwater is 34 feet (10.3 meters)

Before going diving, set the computer to the type of water you are diving in. This allows for the most accurate calculations with respect to no-decompression limits, etc.

**To set for fresh or salt water:**

1. Press Mode until “dive” is displayed and flashing on the screen.
2. Press Select until “fresh” or “sea” is flashing.
3. Press Set to toggle between fresh and sea water.
4. When finished, press Select to advance to the next option (max depth alarm) or to exit, press and hold Mode for 1 to 2 seconds to return to time mode.

## Setting the maximum depth alarm

The NiTek Duo has a maximum depth alarm that is activated when the diver reaches the maximum depth that is set. When the max depth is reached, an audible alarm sounds and the display flashes for three seconds.

The alarm can be turned on or off and can be set from 30 to 320 feet (9 to 97 meters).

**To set the maximum depth alarm:**

1. Press Mode until “dive” is displayed and flashing on the screen.
2. Press Select until the screen changes and max depth is flashing.
3. Press Set to set the depth that you want the alarm to sound.
4. Press Select.

   The max depth alarm on/off flashes.

5. Press Set to toggle the alarm on and off.
6. When finished, press Select to advance to the next option (dive time alarm) or to exit, press and hold Mode for 1 to 2 seconds to return to time mode.

## Setting the dive time alarm

The NiTek Duo has a dive time alarm that is activated when the diver reaches the dive time that is set for the dive. When the dive time is reached, an audible alarm sounds and the screen flashes for three seconds. Dive time alarm can be used when you want to set a maximum dive time for your dive. The alarm indicates when this time has expired.

The alarm can be turned on or off and can be set from 10 to 590 minutes.

### To set the dive time alarm:

1. Press Mode until “dive” is displayed and flashing on the screen.
2. Press Select until the screen changes and dive time is flashing.
3. Press Set to set the time when you want the alarm to sound.
4. Press Select.

   The dive time alarm on/off flashes.
5. Press Set to toggle the alarm on and off.
6. When finished, press and hold Mode for 1 to 2 seconds to return to time mode.

## Setting the computer for metric or Imperial operation

The NiTek Duo can calculate and give you values in Imperial units or metric units. When in metric, depth values are expressed in meters and temperatures are expressed in Celsius (°C). When in Imperial, depth values are expressed in feet and temperatures are expressed in Fahrenheit (°F).

**To set for metric or Imperial operation:**

1. Press Mode until “dive” is displayed and flashing on the screen.
2. Press and hold Select and Set simultaneously for 5 to 6 seconds.

   The computer beeps and changes to either feet (ft) or meters (m).
3. When finished, press and hold Mode for 1 to 2 seconds to return to time mode.

## Understanding FO2 default

In your entry-level Enriched Air Nitrox training, you learned that among the greatest risks Nitrox (EANx) use poses is CNS oxygen toxicity. CNS oxygen toxicity can occur if Nitrox is breathed at depths where the partial pressure of oxygen (PO2) exceeds safe limits.

The NiTek Duo is designed to help divers avoid such situations by presenting information and warnings regarding current PO2 levels and cumulative exposure to elevated PO2s. To do so, the NiTek Duo must be set to an FO2 that accurately matches the concentration of oxygen in the gas mixture being breathed.

Similarly, the NiTek Duo is designed to help divers avoid decompression illness by providing no-decompression limits (NDLs) or mandatory decompression stop information. Again, to do so, the NiTek Duo must be set in a manner that accurately matches the concentration of nitrogen being breathed.

When this information is not available, the NiTek Duo attempts to protect divers by basing its oxygen- and nitrogen-exposure calculations on a “worst case” assumption. This is, that calculations are based on a mixture containing up to 79 percent nitrogen and 99 percent oxygen. This “worst case” calculation is what is referred to as the FO2 default setting.

Default warning indicated by Nitrox flashing and a dashed line for mix1

### When and how FO2 default occurs

One factor in determining if and when your NiTek Duo's FO2 setting is in default, is whether you set one or both mixes for air or Nitrox.

- If you set either mix for air (an FO2 of 21 percent), the computer assumes that subsequent dives will be made using air. This means that the mix set for air remains set for air, dive after dive, without defaulting.
- If you set either mix for Nitrox or oxygen (FO2s of 22 to 99 percent), the computer assumes that subsequent dives will be made on Nitrox. Thus, to protect you from accidentally diving a Nitrox mixture that cannot accurately be monitored, the computer's FO2 setting defaults at midnight (it does not default at midnight if you are under water).

### Dealing with FO2 default

The best way to deal with FO2 default is to simply avoid it. Make sure that prior to every dive you check the FO2 settings for mix1 and mix2. Make sure they accurately match what you are going to breath during the dive.

When the computer is in FO2 default mode, the Nitrox symbol flashes. This indicates that you need to set the percentages for mix1 and mix2 to the correct FO2.

If you go diving when the computer is in FO2 default mode, the OLI and PO2 symbols, current depth, and PO2 value flash. The

computer's ability to accurately monitor your exposure to oxygen no longer exists.

**Note:** You should not rely on the NiTek Duo as the sole means of tracking your exposure to elevated partial pressures of oxygen (PO2s). It is recommended that you use either a second Nitrox-capable computer or another tracking method, such as Nitrox tables.

## Using gauge mode

If you do not want to use the NiTek Duo as a normal "dive computer," the NiTek Duo has a gauge operation. Gauge operation is when the NiTek Duo is operating simply as a depth gauge and bottom timer. "Gage" is displayed on the screen and exposure to nitrogen and oxygen and no-decompression limits are not tracked and no bar graphs are displayed. This mode is used by divers who are relying solely on dive tables for decompression information. The operating depth limit when in gauge operation is 656 feet (200 meters).

**Note:** You cannot select gauge operation if the computer calculates that there is still residual nitrogen remaining from a previous dive. Also, you cannot return to dive computer operation until 48 hours have passed since your last dive.

In gauge mode, you can still set the profile sampling rate, salt or fresh water use, max depth and dive time alarms. For more information, see "Dive option set and display mode."

**To select and setup gauge operation:**

1. Press Mode until "dive" is displayed and flashing on the screen.

2. Press Set to select gauge operation.

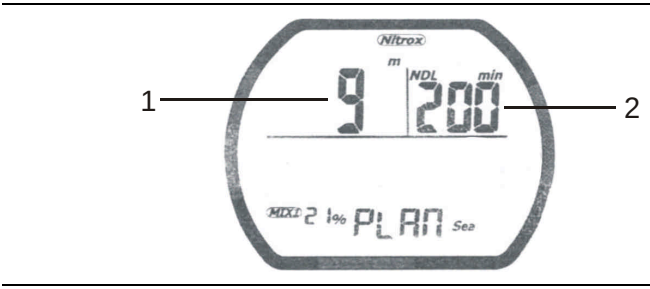
   “Gage” is displayed in place of “dive.”

3. Press Select to set the profile sampling rate. Press Set to select 15-second or 30-second.
4. Press Select to set for salt or fresh water use. Press Set to toggle between “sea” and “fresh.”
5. Press Select to set the max depth alarm. Press Set to increase the depth. The alarm turns on with “on” displayed above the depth.
6. Press Select to turn max depth alarm on or off.
7. Press Select to set the dive time alarm. Press Set to increase the time in 10 minute intervals. The alarm turns on with “on” displayed above the depth.
8. Press Select to turn the dive time alarm on or off.
9. When finished, press and hold Mode for 1 to 2 seconds to return to time mode.

## Plan mode

Plan mode enables you to determine how long you can stay at various depths while remaining within the no-decompression limits. The no-decompression time limits are based on the percentage that is set for mix1. If you are making a dive within 24 hours of a previous dive, the no-decompression time limits are based on the residual nitrogen remaining.

The two most important values that are displayed on the screen in plan mode are the depth and no-decompression time limit.




**(1) Depth:** When you first enter plan mode, the initial depth displayed is 30 feet (9 meters). You can advance the depth in 10 foot (3 meter) increments. Fourteen different dive plan depth increments can be displayed to a maximum depth of 160 feet (48 meters).

**(2) No-decompression limit (NDL):** Depending on the depth displayed and the current FO2 setting, the available no-decompression limit, up to a maximum of 200 minutes, is displayed. If the computer is in FO2 default, a series of horizontal lines appears.

If the NiTek Duo calculates that there is residual nitrogen present from previous dives, the available no-decompression limits are shorter. Depending on how much residual nitrogen is present, no NDL time may be displayed for some deeper depths. If this takes place, a series of horizontal lines are displayed. Similarly, for combinations of depth and FO2 that would cause a diver to exceed a limiting PO2 of 1.6 atmospheres, a series of horizontal lines appears in place of the no-decompression limit.

**To enter plan mode:**

1. Press Mode until “plan” is displayed on the screen.
2. Press Set to advance the depth or press Select to decrease the depth.

   The no-decompression time limits change automatically based on the depth.
3. If you want to exit plan mode, press and hold Mode for 1 to 2 seconds to return to time mode.

**WARNING:** Do not plan dives to depths deeper than those for which the NiTek Duo is capable of displaying an available no-decompression limit. Doing so could cause you to exceed the no-decompression limits or a limiting PO2 of 1.4 atmospheres (1.6 atmospheres for deco). This may increase your risk of decompression illness or CNS oxygen toxicity and can lead to serious personal injury or death.

## Diving mode (normal computer mode)

Diving mode is automatically entered when the computer enters the water. It begins performing its dive calculations once you descend below 5 feet (1.5 meters).

**Caution:** Prior to diving, always check to ensure that the FO2 settings are correct and that the computer is not in FO2 default.

While in diving mode, the computer calculates and displays information about your dive and prompts you with safety stop information and warnings if needed.

While underwater, there are two screens you can toggle between and you can switch from mix1 to mix2 when needed. You can also activate the back light feature.

### Primary underwater screen

When you enter the water, the primary screen shows your depth, remaining no-decompression limit, dive time, PO2 for selected mix, N2 and O2 bar graphs, and the ascent rate bar graph.

**(1) Remaining no-decompression limit (NDL):** This is the time that is remaining (in minutes) before you reach the no-decompression limit. This NDL time limit increases when you ascend and decreases when you descend.

**(2) Dive time:** This is the time spent (in minutes) underwater, measured from the time you descended below 5 feet (1.5 meters).

**(3) O2 (OLI) bar graph:** This is the oxygen limit index (OLI) that calculates the cumulative effect of your exposure to elevated

partial pressures of oxygen (PO2s). There are a maximum of eight bars. When all bars are displayed, it means that you have used 100 percent of your “CNS” clock. This graph increases when you descend due to higher partial pressures and may decrease when you ascend.

**(4) Depth:** This is the current depth.

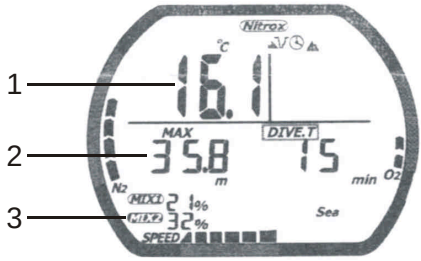
**(5) PO2:** This is the partial pressure of O2 at your current depth. It is based on the FO2 settings for mix1 or mix2.

**(6) Residual nitrogen (N2) bar graph:** This is how much nitrogen the computer assumes your body has absorbed. There are a maximum of nine bars. When all bars are displayed, it means that you are at or have exceeded the no-decompression limits.

**(7) Ascent rate bar graph:** This is a visual representation of how fast you are ascending. There are a maximum of nine bars. When all bars are displayed, you have exceeded the maximum safe ascent rate.

## Secondary underwater screen

While underwater you can change to the secondary diving mode screen that displays additional information. When you switch screens, temperature, maximum depth, and mix2 are displayed.




**(1) Temperature:** This is the lowest temperature that has been reached during the dive.

**(2) Maximum depth:** This is the maximum depth that has been reached during the dive.

**(3) Mix2:** The percentage that you set for mix2 is displayed.

**To display the secondary diving mode screen:**

1. Press and hold Set.

   The back light turns on, and the secondary screen is displayed.

2. Release Set to return to the primary diving mode screen.

## Changing gas mixes underwater

Because the NiTek Duo has the ability to use two different gas mixes during a dive, you need the ability to switch between mix1 and mix2 while underwater.

**Note:** Only switch gas mixes when you have reached the safe operating depth limit for the gas you are switching to.

**To change gases underwater:**

1. Press and hold Select for three to four seconds.

   If you are using mix1, mix2 flashes and is displayed. If you are using mix2, mix1 flashes and is displayed.

2. Release Select to return to the primary diving mode screen.

## Safety stop indication

The NiTek Duo has an automatic three-minute safety stop feature built in. On any dive, when you descend below 33 feet (10 meters) and then ascend above 20 feet (6 meters), “stop” is displayed and the NDL changes to a three-minute countdown.

During this time, if you ascend above 10 feet (3 meters), the countdown pauses. It resumes when you descend below 10

feet (3 meters). If you descend below 20 feet (6 meters) during this time, “stop” and the three-minute countdown will disappear; the NDL readings reappear. When you again ascend above 20 feet (6 meters), the three-minute countdown restarts.

## Warnings while in diving mode

While in diving mode, there are several warnings that you should be alert to.

### Default warning

If either mix1 or mix2 is in default at the beginning of a dive, an audible alarm sounds for three seconds. If you ascend and set the mix percentages, you can restart the dive. The Nitrox symbol also flashes, which is the best indication that the computer is defaulted before entering the water.

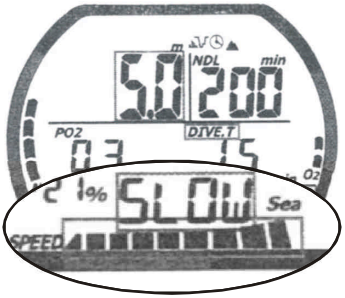
Default warning indicated by Nitrox flashing and a dashed line for mix1

### Ascent rate warning

The NiTek Duo assumes that you keep your ascent rate within the following limits:

| Depth range | Ascent rate |
|---|---|
| 0 to 19 feet (0 to 5.9 meters) | 26 feet (8 meters) per minute |
| 20 to 58 feet (6 to 17.9 meters) | 39 feet (12 meters) per minute |
| 59 feet (18 meters) or deeper | 52 feet (16 meters) per minute |

If you exceed these ascent rates, an audible alarm sounds for three seconds and “slow” is displayed and flashes on the screen. The warning displays until you slow your ascent to an acceptable rate or you reach 5 feet (1.5 meters). If the ascent rate is violated twice, the “slow” symbol appears in log mode after the dive.

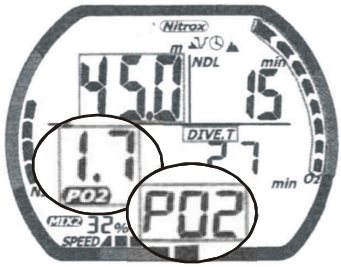



Ascent rate warning with “slow” displayed and full bar graph

### PO2 limit warning

The PO2 warning indicates that you have exceeded the 1.4 atmospheres and/or 1.6 atmospheres for the gas you are breathing. If you are using mix1 and exceed a PO2 of 1.4 atmospheres, an audible alarm sounds for three seconds, and the PO2 value, PO2 symbol, and current depth blink. If you exceed a PO2 of 1.6 atmospheres, in addition to the above audible and visual alarms, the OLI bar graph flashes. If you are using mix2 and exceed a PO2 of 1.6 atmospheres, all visible alarms appear and the audible alarm sounds twice.

**Note:** If the PO2 alarms activate at a depth of 20 feet (6 meters) or less, you most likely have not exceeded the limiting PO2. It is more likely that you forgot to set the FO2 percentages prior to the dive. As a result, the computer has entered the FO2 default. See “Understanding FO2 default” for more information.



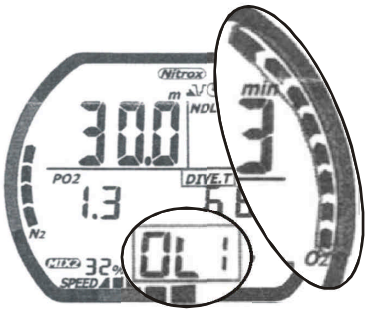

PO2 limit warning with the PO2 limit number and “PO2” displayed and flashing on the screen

### Oxygen limit index (OLI) warning

The NiTek Duo’s oxygen limit index (OLI) reflects the cumulative effect of your exposure to elevated partial pressures of oxygen. The PO2 warning only accounts for the intensity of the exposure, but the OLI accounts for both the intensity and length.

When seven of the O2’s eight bars are displayed, the computer’s audible alarm sounds for three seconds, and “OLI” flashes for ten seconds. If you do not ascend to a shallower depth, and all eight of the O2’s bars are displayed, the alarm sounds twice again and “OLI” flashes again. “OLI” continues to flash until the O2 bar graph drops to seven bars. This warning will appear in log mode after the dive.

Should the OLI and PO2 warnings activate at roughly the same time—and at relatively shallows depths, early in the dive—you most likely have not exceeded your actual oxygen limits. What has happened, is that you forgot to set the FO2 percentages prior to the dive and the computer has FO2 defaulted. See “Understanding FO2 default” for more information.

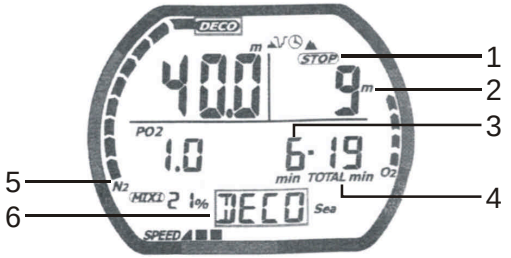



OLI warning with “OLI” displayed and flashing on the screen

### Decompression warning

If you exceed the no-decompression limits, the computer enters decompression mode. An audible alarm sounds for three seconds indicating that you have decompression stop requirements.

**Caution:** Decompression diving is considered to substantially increase your risk of decompression illness more than dives made within no-decompression limits.




Decompression warning with “deco” displayed on the screen

**(1) Stop symbol:** The “stop” symbols displays indicating that you have to stop at the depth displayed.

**(2) Required stop depth:** This is the required decompression stop depth.

**(3) Required stop time:** This is the time you must remain at the indicated stop depth.

**(4) Total ascent time:** This is the total amount of time (in minutes) you must spend at the decompression stops and the ascent time between decompression stops.

**(5) Nitrogen (N2) bar graph:** This is how much nitrogen the computer assumes your body has absorbed. There are a maximum of nine bars. When all bars are displayed, it means that you are at or have exceeded the no-decompression limits and have entered decompression.

**(6) Deco symbol:** The "deco" symbol displays when you have decompression requirements.

### Decompression stop violation warning

A decompression stop violation warning takes place when you ascend to a shallower depth than the indicated stop depth or if you do not spend sufficient time at the required depth before ascending. When you enter this violation, the computer's audible alarm sounds, and the current depth, stop depth, stop time, and "deco" flashes. These items continue blinking as long as you remain shallower than the indicated stop depth.

**Note:** During a deco stop violation, the computer's ascent rate warning does not function.

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**Caution:** If you do not correct an indicated deco stop violation, the warnings continue for several minutes after surfacing. At this point, the computer is not usable for the next 48 hours.

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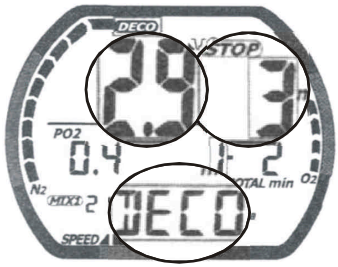


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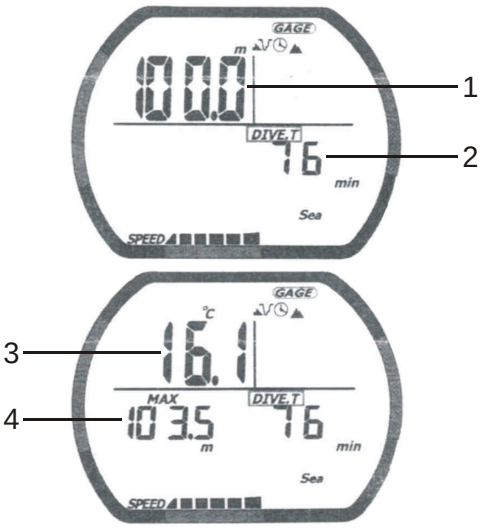
## Diving mode (gauge mode)

Diving mode (gauge mode) is automatically entered when the computer enters the water. It begins displaying depth and time once you descend below 5 feet (1.5 meters).

Gauge operation is when the NiTek Duo is operating simply as a depth gauge and bottom timer. “Gage” is displayed on the screen and exposure to nitrogen and oxygen and no-decompression limits are not tracked, and no bar graphs are displayed. This mode is used by divers who are relying solely on dive tables for decompression information. The operating depth limit when in gauge operation is 656 feet (200 meters).

**Note:** To enter and set up gauge mode operation, see “Using gauge mode.”

While in gauge mode underwater, there are two screens you can toggle between. The primary screen displays depth and time. The secondary screen displays maximum depth and temperature.




Primary and secondary screens when diving in gauge mode

**(1) Current depth:** This is the current depth of the dive.

**(2) Total dive time:** This is the total time for the dive.

**(3) Temperature:** This is the lowest temperature reached during the dive.

**(4) Max depth:** This is the maximum depth reached during the dive.

### To toggle between screens underwater:

1. Press and hold Set.

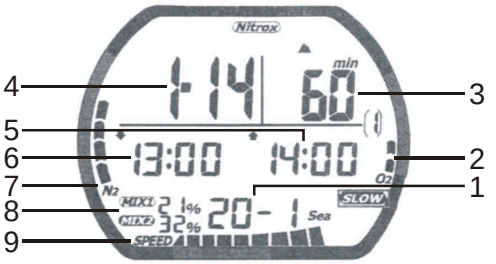
   The back light turns on, and the computer switches to the secondary screen.

2. Release Set to return to the primary screen.

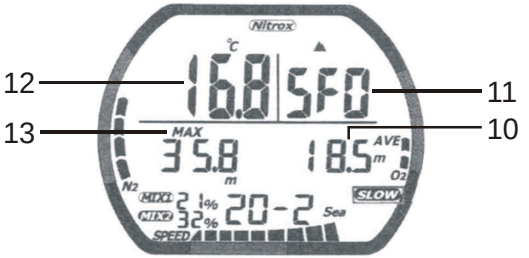
## Log mode

For each dive, the NiTek Duo stores information, such as depth, time, temperature, etc. in a log. This stored log information can be viewed directly from the NiTek Duo's screen when in log mode.

Because of the amount of information the NiTek Duo stores, there are two pages that you can toggle between for each dive. Each dive is assigned a number, beginning with one, for the day. Each log page displays the log number and the page number, making it easy for you to toggle between the dive log pages.




Page one for a dive in log mode




Page two for a dive in log mode

**(1) Dive number and page number:** The first number is the dive number for the day. The second number is the log page number. Each dive has two pages of logged information.

**(2) O2 OLI bar graph:** This indicates CNS toxicity level at the end of the dive.

**(3) Dive time:** This is the actual in water time for the dive.

**(4) Date:** This is the month and day of the dive.

**(5) Ascent time:** This is the time you surfaced from the dive, indicated by an up arrow.

**(6) Descent time:** This is the time you started the dive, indicated by a down arrow.

**(7) Nitrogen (N2) exposure bar graph:** This is the amount of residual nitrogen in your body at the end of the dive.

**(8) FO2 gas percentages:** These are the FO2 gas percentages that you entered for the dive. All calculations were based on these percentages.

**(9) Ascent rate bar graph:** This indicates the maximum ascent rate reached during the dive. If "slow" is displayed, this indicates that the ascent rate warning alarm sounded during the dive.

**(10) Average depth:** This is the average depth reached during the dive.

**(11) Safety factor:** This indicates the safety factor that was set and used for the dive.

**(12) Temperature:** This is the coldest temperature reached during the dive.

**(13) Max depth:** This is the maximum depth reached during the dive.

### To view a dive log:

1. Press Mode until "log" is displayed on the screen.

   "Log" is only displayed for a second, and then the dive number and page number are displayed.

2. Press Select to scroll "up" through the logged dives. To fast scroll, press and hold Select.

   Press Set to scroll "down" through the logged dives. To fast scroll, press and hold Set.

3. Once a dive log is selected, you can use Set and Select to toggle between page one and page two of the dive log.

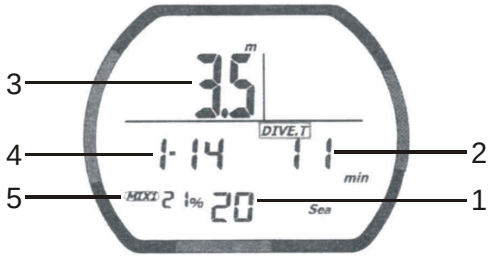
4. If you want to exit log mode, press and hold Mode for 1 to 2 seconds to return to time mode.

## Profile mode

Profile mode enables you to see a record of the depths you reached at various points during a dive. You can display a detailed profile of each dive stored in the log. When a dive is selected, the computer automatically displays the depth and the time in the dive when you reached that depth until it reaches the end of the dive.

Dive profile information is either stored in 15- or 30-second intervals during a dive. This must be set in dive mode before a dive. Refer to “Setting the dive profile sampling rate” for more information.

The dive number and date of the dive are displayed when you scroll through the dives. This makes it easy to find the dive profile you want to view.




**(1) Dive log entry number:** This is the dive number that corresponds to the dive number when in log mode.

**(2) Dive time:** This tells you at what time during the dive you reached the depth indicated.

**(3) Depth:** This is the depth that corresponds to the displayed dive time. Depending on what profile sampling rate you have set, either two depth readings (30-second rate) or four depth readings (15-second rate) are displayed for each minute during a dive.

**(4) Date:** The day and month the dive took place.

**(5) FO2 percentage:** This shows the mix number and FO2 percentage of the gas being used at each point during the dive.

**To view a dive profile:**

1. Press Mode until “prof” is displayed on the screen.

   “Prof” is in only displayed for a second, and then switches to the dive log entry number for the “last” dive stored in the computer.

2. Press Set to scroll “up” through the logged dives. To fast scroll, press and hold Select.

   Press Select to scroll “down” through the logged dives. To fast scroll, press and hold Select.

3. Once a dive profile is selected, the computer automatically progresses through the different depths and times of the dive.

   Press and hold Select to pause at a certain depth/time. Release Select to continue progressing through the dive.

4. If you want to exit profile mode, press and hold Mode for 1 to 2 seconds to return to time mode.

# PC transfer mode

If you purchased the optional personal computer interface for the NiTek Duo, you can transfer the stored dive log information to your PC.

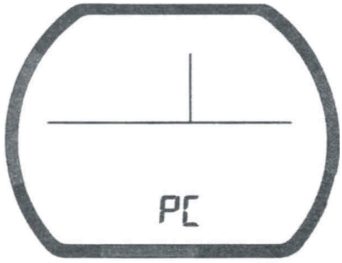
## Before transferring the dive log

You must complete the following before transferring the dive log.

- Install the NiTekLogic software onto your PC. Open the program > click Options > and check the Uploader tab. Make sure the COM port selection in the NiTekLogic software matches the COM port you are connecting to on your PC.
- Plug one end of the cable supplied with the interface into a COM port on your PC. Plug the other end into the interface module.
- Set the NiTek Duo to PC transfer mode as described below.
- Place the NiTek Duo on the interface module and secure the strap over the computer. Click the computer icon in NiTekLogic. A dialog box should appear indicating the beginning of data transfer. If it is not uploading, check your COM port settings.

### Notes

- If the dialog box says “negotiating” and cuts off before saying “transfer,” there is probably a COM port setting issue. Check to see that you are using the correct COM port.
- If there is an error reported after the dialog box says “transfer,” check for a loose or dirty connection between the NiTek Duo and the interface module.




**To enter PC transfer mode:**

1. Press Mode until “PC” is displayed on the screen.
2. Transfer the dive log data to your PC. Follow the instructions on the previous page.
3. To exit PC transfer mode, press and hold Mode for 1 to 2 seconds to return to time mode.

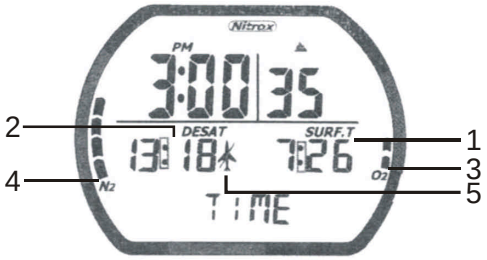
## Surface mode (upon surfacing from a dive)

Once you surface from a dive, the NiTek Duo automatically switches to time mode, with “time” displayed on the screen. In addition to the normal information displayed in time mode such as time of day, there is other information that is displayed that pertains to the dive you just completed. This includes:

- Desaturation time
- Surface interval time
- No-fly symbol
- Nitrogen (N2) bar graph
- Oxygen limit index (OLI) bar graph

This additional information is displayed on the screen until the NiTek Duo calculates that it is no longer needed or after 24 hours have passed since the last dive.

**Note:** If you are making repetitive dives, you need to pay attention to your surface interval and use it in conjunction with plan mode. This ensures that you stay within no-decompression limits.




NiTek Duo showing surface interval time, desaturation time, no-fly symbol, and N2 and O2 bar graphs while in time mode

**(1) Surface interval time:** This is the amount of time you have spent on the surface since your last dive if there is residual nitrogen present from a previous dive. It can display up to 24 hours of surface interval time.

**(2) Desaturation time:** This is the amount of time, expressed in hours and minutes, that must pass before the residual nitrogen

levels drop to a point where subsequent dives are treated as a single (non-repetitive) dives. This is not the same as “time to fly.”

**(3) O2 OLI bar graph:** This indicates CNS toxicity level at the end of the dive. This drops as your surface interval time increases.

**(4) Nitrogen (N2) exposure bar graph:** This is the amount of residual nitrogen in your body at the end of the dive. This drops as your surface interval time increases.

**(5) No-fly symbol:** This symbol, when displayed, indicates that you should not fly or go to any altitude higher than the one you are diving in until it disappears from the screen.

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**WARNING:** It is recommended that you wait at least 24-hours following any dive before flying in an aircraft or driving to altitude. Failure to allow sufficient surface interval time before doing so may increase your risk of decompression illness (DCI).

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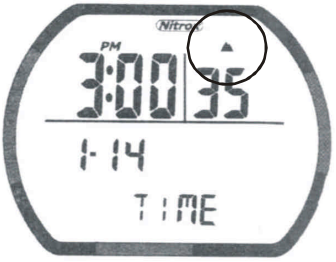
## Altitude operation

The NiTek Duo adjusts automatically for diving at altitudes of up to 19,685 feet (6,000 meters). To show that the NiTek Duo has made the altitude adjustment, it displays the altitude settings using symbols representing mountains.




**Altitude rank symbols**

| Symbol | Altitude range |
|---|---|
| No symbol | Sea Level to 3,281 feet (1000 meters) |
| ▲ | 2,297 to 5,906 feet (700 to 1,800 meters) |
| ▲▲ | 4,593 to 8,530 feet (1,400 to 2,600 meters) |
| ▲▲▲ | 7,546 to 19,685 feet (2,300 to 6,000 meters) |
| **E** | Out of range above 19,685 feet (6,000 meters) |

Prior to using the NiTek Duo at altitudes substantially above sea level, you should find out what the actual altitude of your dive site is. Make certain that the altitude settings the NiTek Duo displays accurately match the altitude you are at.

**Notes**

- Do not use the NiTek Duo unless the altitude settings accurately match the actual height above sea level you are diving in. Doing so could cause the NiTek Duo to display inaccurate information.

- Do not use the NiTek Duo when the “E” symbol is displayed. This means that you are above an altitude of 19,685 feet (6,000 meters), which is beyond the NiTek Duo’s ability to function accurately.
- Do not place the NiTek Duo in dive mode when making sudden, substantial changes in altitude, such as when flying in an airplane. This can be caused by storing the NiTek Duo with wet dive gear, which can touch its external electrical contacts and cause it to enter dive mode. This can interfere with the computer’s ability to function accurately.

The NiTek Duo monitors and displays altitude information in all modes, except PC transfer mode. Upon arriving at altitude, the NiTek Duo’s residual nitrogen bar graph may show that there is excess nitrogen present, even though you may not have made any dives in the preceding 24 hours.

If you have obtained the altitude specialty diver training which everyone should do before diving at altitudes substantially above sea level, you already understand that this should be expected. By ascending to a higher altitude from a lower one, your body has more nitrogen saturated in body tissues than would be present had you spent the preceding 24 hours at the higher altitude. By displaying residual nitrogen and a surface interval, your NiTek Duo is merely reflecting this fact.

If the level of residual nitrogen calculated by the NiTek Duo is unusually high (seven or eight bars) when going to altitude, the computer will be unable to enter dive mode. Avoid taking the computer to altitude when residual nitrogen levels are this high, and do not enter the water until nitrogen levels have dropped substantially.

Chapter 3

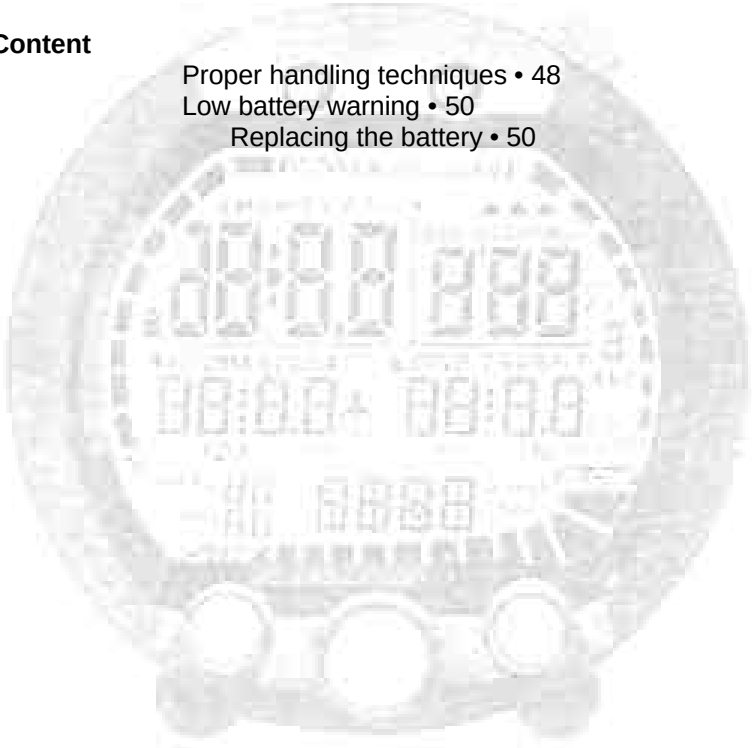
# Care and maintenance

**Summary**

This chapter provides care and maintenance and battery information for the NiTek Duo.

**Content**

Proper handling techniques • 48
Low battery warning • 50
Replacing the battery • 50



## Proper handling techniques

The NiTek Duo is constructed to withstand the most demanding diving conditions. It is, however, a high precision tool, which requires proper care.

**Caution:** Failure to follow these handling techniques may result in damage to the NiTek Duo.

- Do not store the computer in hot and/or humid environments. The pressure transducer is sensitive to both heat and humidity. If impaired, it may cause incorrect altitude or depth readings.
- When in hot and/or humid environments, dip the computer in water for several minutes to cool it to room temperature before using it. If it is cold, allow the computer to warm to room temperature. Do not take it underwater immediately after doing so.
- Do not transport your NiTek Duo on an aircraft or take it to altitude while it is sealed in an air-tight container. Doing so may interfere with its ability to correctly read, display, and track depth information.
- The NiTek Duo's Liquid Crystal Display (LCD) may darken if left in a hot environment (such as on a car's dashboard). It will return to normal once allowed to cool, however, extensive exposure to heat may shorten LCD life.
- Be aware that weather-related changes in air-pressure can cause incorrect display of altitude settings. Be sure to check indicated altitude settings against actual altitude before use. Your NiTek Duo is not to be disassembled by anyone other than Dive Rite or its authorized dealers. Unauthorized disassembly will violate the warranty.
- If the NiTek Duo does not appear to be functioning properly, do not use it to dive. Return it to your authorized Dive Rite dealer for repair.
- The NiTek Duo should not come in contact with solvents or any type of chemical substances

- Do not use compressed air to dry the NiTek Duo
- Do not use the NiTek Duo in hyperbaric chambers if the device is not fully submerged in water
- Always rinse the computer with freshwater after use
- Store the NiTek Duo in a cool, dry location. After diving, wipe the computer dry and store it in a location separate from other damp items.

## Low battery warning

The battery that comes with the NiTek Duo is designed to last for up to three years under normal use. You may get more or less use from the battery depending on how often it is used and how it is cared for.

**Cautions**

- All NiTek Duo functions may cease within two to three days of the low battery symbol first appearing. Always have low batteries replaced promptly.
- A depleted battery that is left in a NiTek Duo for a long period of time may leak. Replace batteries promptly.

### Replacing the battery

Battery replacement is an easy operation that can be done by the user. The battery must be replaced whenever the low battery symbol (fixed or blinking) is displayed.

**Note:** When you replace the battery, all data regarding desaturation, time, and date, etc. is lost. Never replace the battery when desaturation is under way, since all data for desaturation calculation would be lost.

**To replace the battery:**

1. Unscrew the clear back cover using a coin in the direction indicated by the arrows.

2. Examine the battery and battery housing for signs of corrosion. Wipe off any sand or dirt from the cover and o-ring.
3. Remove the battery.
4. Replace the battery; making sure that the polarity is correct.

   For correct battery size, refer to “Specifications.”
5. Place a thin layer of silicone grease on the cover o-ring.
6. Screw the battery cover back into place. Do not over tighten.
7. Reset the time and date.

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